Refine Search

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Terms	Documents
L1 and L4	1

Database:
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DB=PGPB,USPT,USOC,EPAB,JPAB,DWPI,TDBD; PLUR=YES; OP=OR			
L5	l1 and L4	1	L5
L4	frequency	1863229	L4
L3	l1 and L2	1	L3
L2	code	2224143	L2
L1	6324473.pn.	2	L1

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L12 and L13	6

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L14

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DATE: Friday, January 14, 2005 Printable Copy Create Case

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L14	l12 and L13	6	L14
L13	code	2223767	L13
L12	l10 and L11	14	L12
L11	wireless	227545	L11
L10	rover and l2	14	L10
L9	l2 and L8	1	L9
L8	surveying adj rover	6	L8
L7	l2 and l4	1	L7
L6	l2 and l5	0	L6
L5	l1 and L4	6	L5
L4	surveying adj vehicle	71	L4
L3	l1 and L2	1	L3
L2	(gps adj correction) adj (signal or data)	174	L2
L1	construction adj vehicle	8383	L1

END OF SEARCH HISTORY

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Search Results -

Terms	Documents
L10 and L11	14

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Search: L12

Refine Search

Recall Text Clear Interrupt

Search History

DATE: Friday, January 14, 2005 Printable Copy Create Case

Set Name side by side	**Query**	**Hit Count**	**Set Name** result set
DB=PGPB,USPT,USOC,EPAB,JPAB,DWPI,TDBD; PLUR=YES; OP=OR			
L12	l10 and L11	14	L12
L11	wireless	227545	L11
L10	rover and l2	14	L10
L9	l2 and L8	1	L9
L8	surveying adj rover	6	L8
L7	l2 and l4	1	L7
L6	l2 and l5	0	L6
L5	l1 and L4	6	L5
L4	surveying adj vehicle	71	L4
L3	l1 and L2	1	L3
L2	(gps adj correction) adj (signal or data)	174	L2
L1	construction adj vehicle	8383	L1

END OF SEARCH HISTORY

L12: Entry 9 of 14 File: USPT Oct 31, 2000

DOCUMENT-IDENTIFIER: US 6140957 A
TITLE: Method and apparatus for navigation guidance

Brief Summary Text (5):
While selective availability (S/A) and environmental conditions may degrade the position signals to 100 meter accuracy, differential correction (DGPS) and real time kinematic (RTK) processes may be employed increase accuracy to the within 1 to 2 centimeter accuracy. RTK and real time computation of DGPS both require the use of an additional radio frequency receiver for reception of additional data that is used to compute a corrected, more accurate, position. Thus, the satellite survey device which is typically called the "rover device", includes a range pole for identifying the point for which a location is to be computed, a user input/output device for entry and display of information and data, a satellite receiver and a radio receiver.

Brief Summary Text (6):
The range pole has attached to it an antenna for receiving GPS signals and a circular level or vial. The user holds the range pole and moves the range pole about until the level indicates that the range pole is vertically oriented and the bottom of the pole touches a location to be surveyed. Once vertically oriented, the information received via the GPS antenna can be used to accurately compute the position of the location. Typically, the user will have a backpack that includes a wireless link,

Brief Summary Text (7):
such as a radio modem, for receiving additional data, e.g., correction signals, from a reference station, e.g., a differential GPS (DGPS) base station. Using DGPS technology, more precise measurements are obtained. The backpack also contains equipment and circuits for generating positional information based upon the signals received through the antenna and the wireless link. The data collection device enables the user to make manual entries, and also provides a visual reading of the survey measurements obtained.

Detailed Description Text (6):
In the embodiment depicted in FIG. 3, certain components are placed in a fanny pack 305 which hooks around the user's waist with a belt. For example, the equipment for maintaining the wireless link, such as radio modem 170 and the data storage device may be placed in the fanny pack 305, freeing up space in the handheld portion 335 of the device. However, it is preferred that the pointing device 355, the orientation device 350, GPS antenna and digital level and heading device be maintained in the handheld portion 335 of the device to allow accurate position data to be measured and facilitate position identification by the pointing device 335.

Detailed Description Text (19):
Preferably, the system 400 is also capable of performing one or more correction techniques for improving the position fix accuracy. For example, the system 400 may include a radio receiver 420 for receiving additional data, such as RTK data, differential GPS correction signals, or other data for increasing the accuracy of the measurements. Correction signals may be transmitted by a DGPS base station, for

example, and received by the radio receiver 420. These correction signals are then used to adjust the positioning data received through the GPS antenna and receiver 415. Although in the present embodiment, a separate antenna/receiver is used, it is contemplated that one antenna/receiver can be used to receive position signals and correction signals. In one embodiment, the radio receiver 420 may comprise a TrimTalk 900 radio modem manufactured by Trimble Navigation Limited. Importantly, however, the radio receiver 420 may be any device capable of supporting a wireless link with the base station, such as a wireless or cellular modem, a radio receiver or other RF capable device. Further, when direct radio communication between the reference station and the rover device may be obscured, the radio receiver 420 may be configured to operate with one or more repeaters. Additionally, it should be appreciated that additional elements may be added to the system to provide additional functionality and application-specific features as may be required for various applications.

Detailed Description Text (20):
FIG. 4B is a simplified block diagram of an alternate embodiment of the system of the present invention. The device 460 is controlled by system controller and transform calculator 462. Positioning signals are received via a GPS antenna 464 and input to GPS Receiver/Processor 466. Then, the GPS Receiver/Processor may perform differential correction using data received via a differential receiver antenna 468 and receiver 470. As is readily apparent to one skilled in the art, however, other forms of correction may be employed. One such method is known in the art as the RTK method in which a reference GPS station positioned at a known location receives well known GPS observables and makes them available via a radio link, for example, in real-time to the rover device. The rover device may then processes those observables as well as its own observables to determine a more accurate position fix relative to the reference station. The method is described in U.S. Pat. No. 5,519,620 of Talbot et al., which is incorporated herein by reference.

L12: Entry 12 of 14 File: USPT Nov 2, 1999

DOCUMENT-IDENTIFIER: US 5977908 A
TITLE: Handheld surveying device and method

Brief Summary Text (6):
Survey and GIS (Geographic Information System) applications require extremely high accuracy positions measurements. Due to selective availability (S/A) and environmental conditions, the position signals may be degraded to 100 meter accuracy, which is not satisfactory for Survey and GIS use. Differential correction (DGPS) and real time kinematic (RTK) processes are therefore used to increase accuracy to the within 0.2-5 meter accuracy and centimeter accuracy, respectfully. RTK and real time computation of DGPS both require the use of an additional radio frequency receiver for reception of additional data that is used to compute a corrected, more accurate, position. Thus, the satellite survey device which is typically called the "rover device", includes a range pole for identifying the point for which a location is to be computed, a user input/output device for entry and display of information and data, a satellite receiver and a radio receiver.

Brief Summary Text (7):
Examples of satellite survey devices include the GPS Total Station.RTM. manufactured by Trimble Navigation Ltd. of Sunnyvale, Calif. (GPS Total Station is a registered trademark of Trimble Navigation Ltd.). The GPS Total Station includes a GPS antenna mounted on a range pole. The user places the range pole over the location to be measured. A simplified drawing of this type of surveying equipment is shown in FIG. 1. The range pole 10 has attached to it the antenna 20 for receiving GPS signals and a circular level or vial 30. The user 40 holds the pole 10 and moves the pole 10 about until the level 30 indicates that the pole is vertically oriented and the bottom of the pole touches the location 50 to be surveyed. Once vertically oriented, the information received via the GPS antenna can be used to accurately compute the position of the location 50. Typically, the user will have a backpack 60 that includes a wireless link, such as a radio modem 70, for receiving correction signals from differential GPS (DGPS) base stations. Using DGPS technology, more precise measurements are obtained. The backpack 60 also contains equipment and circuits for generating positional information based upon the signals received through antenna 20 and wireless link 70. The data collection device 100 enables the user to make manual entries, and also provides a visual reading of the survey measurements obtained.

Brief Summary Text (11):
The present invention describes a handheld surveying device using satellite navigational or similar positioning technology. The handheld device eliminates the need for a range pole and provides accurate position information. In one embodiment, the device is embodied in a handheld housing which includes a global positioning system (GPS) antenna; a processor for processing the GPS signals received; a digital level and heading device for determining the level and heading of the handheld device; a pointing device that enables the user to point the handheld device to the location to be measured; and a measuring device to measure the distance between the handheld device and the location to be measured. In addition, it is preferred that the housing includes a radio receiver for receipt of differential GPS correction signals.

Detailed Description Text (12):
Preferably, the handheld device 300 also includes a radio receiver for receiving differential GPS correction signals for increasing the accuracy of the measurements. Correction signals are transmitted by a DGPS base station, and received by the radio receiver 320. These correction signals are then used to adjust the positioning data received through the GPS antenna and receiver 315. Although in the present embodiment, a separate antenna/receiver is used, it is contemplated that one antenna/receiver can be used to receive position signals and correction signals. Furthermore, other elements may be added to the handheld device to provide additional functionality and features.

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